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  Citation:
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      Originator: National Oceanic and Atmospheric Association (NOAA)/National Ocean Service (NOS)/National Centers for Coastal Ocean Science (NCCOS)/Center for Coastal Ocean Science (CCMA)/Biogeography Team
      Publication_Date: 200107
      Title: St. John, USVI Fish Assessment and Monitoring Data (2001 - Present)
      Publication_Information:
        Publication_Place: Silver Spring, MD
        Publisher: NOAA's Ocean Service, National Centers for Coastal Ocean Science (NCCOS)
      Online_Linkage: http://ccma.nos.noaa.gov/ecosystems/coralreef/reef_fish.html
  Description:
    Abstract: The intent of this work is three fold: (1) to spatially characterize and monitor the distribution, abundance, and size of both reef fishes and macro-invertebrates (conch, lobster, Diadema); (2) to relate this information to in-situ data collected on water quality and associated habitat parameters; (3) to use this information to establish the knowledge base necessary for enacting management decisions in a spatial setting and to establish the efficacy of those management decisions. Toward this end, the Center for Coastal Monitoring and Assessment's Biogeography Team (BT) has completed its fourth year and is beginning its fifth year of work in the US Virgin Islands and Puerto Rico. It is critical, with recent changes in management at both locations (e.g. implementation of MPAs) as well as proposed changes (e.g. zoning to manage multiple human uses) that action is taken now to accurately describe and characterize the fish/macro-invertebrate populations in these areas. It is also important that BT work closely with the individuals responsible for recommending and implementing these management strategies. Recognizing this, BT has been collaborating with partners at the University of Puerto Rico, National Park Service, US Geological Survey and the Virgin Islands Department of Planning and Natural Resources.

    To quantify patterns of spatial distribution and make meaningful interpretations, we must first have knowledge of the underlying variables determining species distribution. The basis for this work therefore, is the nearshore benthic habitats maps (<100 ft depth) created by NOAA's Biogeography Program in 2001 and NOS' bathymetry models. Using ArcView GIS software, the digitized habitat maps are stratified to select sampling stations. Sites are randomly selected within these strata to ensure coverage of the entire study region and not just a particular reef or seagrass area. At each site, fish, macro-invertebrates, and associated water quality and habitat information is then quantified following standardized protocols. By relating the data collected in the field back to the habitat maps and bathymetric models, BT is able to model and map species level and community level information. These protocols are standardized throughout the US Caribbean to enable quantification and comparison of reef fish abundance and distribution trends between locations. Armed with the knowledge of where "hot spots" of species richness and diversity are likely to occur in the seascape, the BT is in a unique position to answer questions about the efficacy of marine zoning strategies (e.g. placement of no fishing, anchoring, or snorkeling locations), and what locations are most suitable for establishing MPAs. Knowledge of the current status of fish/macro-invertebrate communities coupled with longer term monitoring will enable evaluation of management efficacy, thus it is essential to future management actions.

Purpose: 1) To spatially characterize and monitor the distribution, abundance, and size of both reef fishes and macro-invertebrate (conch, lobster, Diadema); 2) To relate this information to in-situ data collected on water quality and associated habitat parameters; 3) To use this information to establish the knowledge base necessary for enacting management decisions in a spatial setting; 4) To establish the efficacy of those management decisions; and 5) To work with the National Coral Reef Monitoring Program to develop data collection standards and easily implemented methodologies for transference to other agencies and to work toward standardizing data collection throughout the US states and territories.
Supplemental_Information: This work is being conducted in collaboration with the University of Puerto Rico, National Park Service, US Geological Survey, and the Virgin Islands Department of Planning and Natural Resources.
Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 200107
Ending_Date: Present
Currentness_Reference: Ground Condition
Status:
Progress: In Work
Maintenance_and_Update_Frequency: once per year
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -64.84
East_Bounding_Coordinate: -64.66
North_Bounding_Coordinate: 18.38
South_Bounding_Coordinate: 18.23
Keywords:
Theme:
Theme_Keyword_Thesaurus: CoRIS Discovery Thesaurus Version 1.0
Theme_Keyword: Numeric Data Sets > Fish Census
Theme_Keyword: Visual Images > Fish
Theme_Keyword: Visual Images > Mammals
Theme_Keyword: Formats of Products > jpg
Theme:
Theme_Keyword_Thesaurus: CoRIS Theme Thesaurus Version 1.0
Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Corals > Reef monitoring and assessment > Reef fish census > Belt transect
Theme_Keyword: EARTH SCIENCE > Oceans > Coastal Processes > Mangroves > Monitoring
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Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Corals > Reef monitoring and assessment > Reef fish census > Linear transect
Theme_Keyword: EARTH SCIENCE > Oceans > Marine Biology > Marine Plants > Seagrass > Monitoring
Theme_Keyword: EARTH SCIENCE > Biosphere > Ecological Dynamics > Species richness
Theme_Keyword: EARTH SCIENCE > Oceans > Marine Biology > Fish > Fish assemblages
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Theme:
Theme_Keyword_Thesaurus: ISO 19115 Topic Category

Theme_Keyword: biota
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Theme_Keyword: oceans
Theme:
Theme_Keyword_Thesaurus: None
Theme_Keyword: coral reef fishes
Theme_Keyword: Visual Images > Reptiles
Place:
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Place_Keyword: COUNTRY/TERRITORY > United States of America > US Virgin Islands > St. John > St. John (18N064W0011)
Place_Keyword: OCEAN BASIN > Atlantic Ocean > Caribbean Sea > Virgin Islands > Virgin Islands > St. John > (18N064W0011)
Access_Constraints: None
Use_Constraints: Please reference NOAA/NCCOS/CCMA/Biogeography Team when utilizing this data in a report or peer reviewed publication. Additionally, knowledge of how this dataset has been of use and which organizations are utilizing it is of great benefit for ensuring this information continues to meet the needs of the management and research communities. Therefore, it is requested but not mandatory, that any user of this data supply this information to the Program Manager: Chris Caldow (email: chris.caldow@noaa.gov).
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Contact_Information:
Contact_Organization_Primary:
Contact_Organization: NOAA/NCCOS/CCMA/Biogeography Team
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Hours_of_Service: 9:00 - 5:00
Data_Set_Credit: This is a cooperative effort between NOAA's Biogeography Team, the National Park Service, and the Virgin Islands Department of Planning and Natural Resources
Data_Quality_Information:
Logical_Consistency_Report: Not applicable
Completeness_Report: This data consists of multiple fish community surveys across all nearshore marine habitats around St. John, US Virgin Islands. Sites were randomly selected and stratified across by habitat types using NOAA's benthic habitat maps of St. John, USVI.
Lineage:
Process_Step:
Process_Description:
Site selection begins by stratifying NOAA's nearshore benthic habitat maps into predetermined habitat strata. Utilizing ArcGIS, sites are then randomly selected within strata throughout the region. Using a handheld GPS unit, the boat captain navigates to previously selected sites. A weighted buoy is dropped to mark any site where "live boating" is necessary. Once on site, divers are deployed and maintain contact with each other throughout the entire census. One diver is responsible for collecting data on the fish communities utilizing the belt transect visual census technique. The belt transect diver

obtains a random compass heading prior to entering the water and records the compass bearing (0-360o) on the data sheet. On site, no attempt to avoid structural features within a habitat such as a pile of conch shells, a sand patch or a tire in a seagrass or sand area should be made as these features affect fish communities and are "real" features of the habitats. Visibility at each site must be sufficient to allow for identification of fish at a minimum of 2m away.

Once reasonable visibility is ascertained, the diver attaches a tape measure to the substrate and allows it to roll out as progress is made along the chosen compass heading for a distance of 25m. The transect should take 15 minutes regardless of habitat type or number of animals present. This allows more mobile animals the opportunity to swim through the transect, and standardizes the samples collected to allow for comparisons. As the tape roles out at a relatively constant speed, the diver records all fish species to the lowest taxonomic level possible that come within 2m of either side of the transect. Each survey is 100m2 in area (25m length X 4m width). To decrease the total time spent writing, four letter codes are used that consist of the first two letters of the genus name followed by the first two letters of the species name. In the rare case that two species have the same four-letter code, letters are added to the species name until a difference occurs. If the fish can only be identified to the family or genus level then this is all that is recorded. If the fish cannot be identified to the family level then no entry is necessary. The number of individuals per species is tallied in 5cm size class increments up to 35cm using visual estimation of fork length. If an individual is greater than 35cm, then an estimate of the actual fork length is recorded. Prior to 2002, fork lengths of fish greater than 35 cm were not always recorded.

Although the habitat should not be altered in any manner by lifting or moving structure, the observer should record fish seen in holes, under ledges and in the water column. To identify, enumerate, or locate new individuals a diver may move off the centerline of the transect as long as they stay within the 4m transect width and do not look back along area already covered. The diver is allowed to look forward toward the end of the transect for the distance left along the transect (i.e. if the diver is at meter 15, he can look 10 meters distant, but if he is at meter 23, he can only look 2 meters ahead). In mangrove areas the diver swims close to the prop roots and looks as far into the mangroves as possible, up to 2m and then out to the edge of the mangrove overhang such that the total area surveyed is still 100m2. In this case, some of the survey may necessarily fall on seagrass habitat. This is allowed as the mangrove habitat is defined as a transition zone habitat. This diver also takes photos of fishes to document color patterns and phases of the different species.

Data Caveats: Overtime, some changes were made to the stratified random site selection process as follows: 1) Habitat strata initially consisted of hard bottom, sand, and seagrass. Sand and seagrass strata were subsequently combined into one soft bottom strata at all three locations (Puerto Rico, St. Croix, and St. John). This action was taken after the February 2002 mission to Puerto Rico. In Puerto Rico, mangroves are sampled in addition to the above strata. 2) In addition to the habitat strata, Puerto Rico originally contained three strata representing levels of protection from waves and currents. These strata were the Bank Shelf, Outer Lagoon and Inner Lagoon. This was changed beginning with the December 2002 mission to simply Protected and Unprotected. 3) a small subset of sites was resampled during each mission through June 2002 in Puerto Rico and October 2002 in St. Croix. These station names contain the letter 'P' indicating they are permanent stations. 4) During the first mission to St. John samples were also stratified by depth (<= 40 ft or >40 ft). 5) The sample area

in St. Croix has increased over time. Initially, samples were collected within historic Buck Island National Monument boundaries as well as outside up to a distance of 0.5 km from those boundaries. In February 2002 the sampling effort was increased to include the entire expanded monument boundaries. Finally in April 2003 the effort was increased again to include areas outside of the Monument for control sites. This area is now almost entirely enclosed within the East End Marine Park of St. Croix. 6) The habitat map utilized to stratify the samples in St. Croix was changed from the original habitat map created with a 1 acre minimum mapping unit to one with a 100m2 minimum mapping unit beginning with the April 2003 mission.
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Spatial_Reference_Information:
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      Latitude_Resolution: 5 decimal places
      Longitude_Resolution: 5 decimal places
      Geographic_Coordinate_Units: Decimal degrees
Entity_and_Attribute_Information:
  Overview_Description:
    Entity_and_Attribute_Overview: We supply abundance and size information of fish species at the lowest possible taxonomic level. This information is collected across all nearshore habitat types. In addition, we provide photographs of many of the taxa. For specific information please see the data dictionary available on the database website.
    Entity_and_Attribute_Detail_Citation: NOAA/NCCOS/CCMA/Biogeography Team
Distribution_Information:
  Distributor:
    Contact_Information:
      Contact_Organization_Primary:
        Contact_Organization: NOAA/NCCOS/CCMA/Biogeography Team
      Contact_Position: Tropical Ecosystem Monitoring and Assessment Database Manager
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        City: Silver Spring
        State_or_Province: MD
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        Country: USA
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      Hours_of_Service: 9:00 - 5:00
  Resource_Description: Downloadable data
  Distribution_Liability: These data were prepared by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, make any warranty, expressed or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference therein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. Any views and opinions expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof. Although all data have been used by NOAA, no warranty, expressed or implied, is made by NOAA as to the accuracy of the data and/or related materials. The act of

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  Standard_Order_Process:
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http://www8.nos.noaa.gov/bpdm_web/staff_login.aspx
    Fees: None
    Ordering_Instructions: Please contact Chris Caldow (chris.caldow@noaa.gov)
Metadata_Reference_Information:
  Metadata_Date: 20050511
  Metadata_Contact:
    Contact_Information:
      Contact_Organization_Primary:
        Contact_Organization: NOAA/NCCOS/CCMA/Biogeography Team
      Contact_Position: Tropical Ecosystem Monitoring and Assessment Project
Manager
      Contact_Address:
        Address_Type: Mailing and Physical Address
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      Hours_of_Service: 9:00 - 5:00
  Metadata_Standard_Name: Content Standard for Digital Geospatial Metadata
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